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ABSTRACT

The processes by which teachers communicate differential performance expectations to different children were investigated through an observational study of dyadic contacts between teachers and individual students in four first-grade classrooms. Teachers ranked children in the class in order of their achievement. Two observers using an interaction analysis system recorded interactions between each teacher and each of three boys and three girls high on her list and three boys and three girls low on her list. Differential teacher expectations for different children were associated with a variety of interaction measures, although many of these relationships are attributable to objective differences in the behavior of the children. However, other differential teacher behavior was observed which is not attributable to objective differences among the children and which is consistent with the hypothesis that differential teacher expectations function as self-fulfilling prophecies. The teachers demanded better performance from those children for whom they had higher expectations and were more likely to praise such performance when it was elicited. In contrast, they were more likely to accept poor performance from students for whom they held low expectations and were less likely to praise good performance from these students when it occurred, even though it occurred less frequently. (Author/JS)

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TEACHERS' COMMUNICATION OF DIFFERENTIAL EXPECTATIONS FOR CHILDREN'S CLASSROOM PERFORMANCE: SOME BEHAVIORAL DATA[1]

Jere E. Brophy and Thomas L. Good

Abstract. The processes by which teachers communicate differential performance expectations to different children were investigated through observational study of dyadic contacts between teachers and individual students in four first-grade classrooms. Differential teacher expectations for different children were associated with a variety of interaction measures, although many of these relationships are attributable to objective differences in the behavior of the children. However, other differential teacher behavior was observed which is not attributable to objective differences among the children and which is consistent with the hypothesis that differential teacher expectations function as self-fulfilling prophecies. The teachers demanded better performance from those children for whom they had higher expectations and were more likely to praise such performance when it was elicited. In contrast, they were more likely to accept poor performance from students for whom they held low expectations and were less likely to praise good performance from these students when it occurred, even though it occurred less frequently. The findings are interpreted as supportive of the hypotheses of Rosenthal and Jacobson concerning teacher expectation effects and as indicative of the behavioral mechanisms involved when teacher expectations function as self-fulfilling prophecies.

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[1]The authors wish to thank Vern Jones for his assistance in collection of data and Jean Romigh and Betty Johnson for their help in manuscript preparation.

Rosenthal and Jacobson (1968) assert on the basis of controversial research presented in Pygmalion in the Classroom that teachers' expectations for student performance function as self-fulfilling prophecies. The "expectancy effects" in the Oak School experiment described in Pygmalion are not as consistent as the authors' interpretations of them would suggest, however, and even the support that they do provide is questionable on methodological grounds (Barber and Silver, 1968; Snow, 1969; Thorndike, 1968). Even if the data and their interpretation are accepted, the Rosenthal and Jacobson work remains only a demonstration of the existence of expectancy effects; their study did not address itself to any of the events intervening between the inducement of teacher expectations and the administration of the criterion achievement test. The present study focuses on these intervening processes, applying the method of classroom interaction analysis to identify and document differential teacher behavior communicating different teacher expectations to individual children.

The lack of data concerning the causal mechanisms at work in the Rosenthal and Jacobson study, combined with the tendency in most secondary sources to oversimplify or exaggerate their findings has cast an aura of magic or mystery around expectation effects. Consequently, it is important to conceptualize such phenomena as outcomes of observable sequences of behavior. The explicit model assumed in the present research may be described as follows:

(a) The teacher forms differential expectations for student performance;

(b) He then begins to treat children differently in accordance with his differential expectations;

(c) The children respond differentially to the teacher because they are being treated differently by him;

(d) In responding to the teacher, each child tends to exhibit behavior which complements and reinforces the teacher's particular expectations for him;

(e) As a result, the general academic performance of some children will be enhanced while that of others will be depressed, with changes being in the direction of teacher expectations;

(f) These effects will show up in the achievement tests given at the end of the year, providing support for the "self-fulfilling prophecy" notion.

A series of interrelated studies will be required to systematically investigate the full model from beginning (how do teachers form differential expectations in the first place?) to end (how do children change so as to begin to conform more closely to teacher expectations?). The present study deals with the second step: given differential teacher expectations, how are they communicated to the children in ways that would tend to cause the children to produce reciprocal behavior? To begin to answer this question, the present study approached the problem through classroom interaction analysis. In contrast to the usual classroom interaction study, however, the present research focused on dyadic interaction between the teacher and individual children.[2]

METHOD

Subjects

The research was carried out in four first-grade classrooms in a small Texas school district which serves a generally rural and lower-class population. However, a large military base located within the district contributes about 45 per cent of the students in the school in which observations were taken. Children from the base tend to be from more urban backgrounds and of a somewhat higher socio-economic status than the local children. The ethnic composition of the school is about 75 per cent Anglo-American, 15 per cent Mexican-American and ten per cent Afro-American, which is representative of the general population of the area.

Research was carried out in four of the nine first-grade classrooms in the school, chosen because there were no assistant teachers present

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[2]In the study of dyadic interaction the individual child (or teacher-child dyad) becomes the unit of analysis, rather than the class as a group. For a discussion of the advantages of this method for studying traditional teacher effectiveness variables and of applications of the method to problems that cannot be approached through ordinary interaction analysis methods, see Good and Brophy (1969).

to complicate the picture (the other five classrooms had pre-service teacher interns assisting the head teacher). The four teachers involved were asked to rank the children in their class in the order of their achievement. These instructions were deliberately kept vague to encourage the teachers to use complex, subjective criteria in making their judgments. The rankings were then used as the measure of the teachers' expectations for classroom performance for the children in their classes. In each class, three boys and three girls high on the teacher's list (highs) and three boys and three girls low on the teacher's list (lows) were selected for observational study. The highs were simply the first six eligible children on the list. This was generally true also for the lows, although a few children low on the lists were excluded from the study because they could not speak English fluently or because of suspected emotional or biological disturbance. Substitutes for each type of child (high boys, high girls, low boys, low girls) were also identified and these were individually observed on days when children in the designated sample were absent.

The teachers had been told that the study was concerned with the classroom behavior of children of various levels of achievement. They were not informed that their own behavior as well as that of the children was being specifically observed. Furthermore, the teachers thought that observations were being taken on everyone in the class and did not know that specific subgroups had been selected for study. By selecting subjects from the extremes of the distributions of teacher's rankings, the chances of discovering differential teacher treatment of the students were maximized. However, the school practiced tracking, achieving homogeneity within the nine classrooms by grouping the children according to readiness and achievement scores. Thus, at least in terms of test scores, objective differences among the children (and, therefore, objective support for the validity of teacher expectations) was minimized.

Observation System

Since the object of the research was to focus on differential treatment of different children, the observation system developed was addressed only to dyadic contacts between the teacher and an individual child, with lecture-demonstration and other teacher behavior directed to the class as a group being ignored. Although the types of interactions coded were partly dictated by the range of situations seen in pilot studies, certain features of the coding system were built in for their specific relevance to the study of communication of differential teacher expectations. One major and consistent feature was that the source of the interaction was always coded, so that it would be determined later whether the interaction was initiated by the teacher or by the child. The types of dyadic interactions coded included teacher-afforded response opportunities, other types of interactions initiated by the children. The teacher-afforded response opportunities included recitations and reading turns in the reading groups and answers to teacher questions (coded separately as to whether they were open questions directed to the class as a whole or direct questions aimed at a particular child). Response opportunities were important events for studying teacher expectations, since at these times the children were attempting to deal with problems relevant to academic subject matter. Consequently, the sequential nature of the initiation and reaction cycles involved in them was retained in the coding system. In addition to coding response opportunities separately by type (as listed above), coders also noted the quality of the child's response (correct, incomplete or partially correct, incorrect or no response) and the type of feedback given by the teacher (praise, criticism, supplying the answer, repeating the question, rephrasing the question or giving a clue, or giving no feedback at all). This retention of sequential relationships allowed later analysis of the relative as well as the absolute differences between the groups.

All dyadic contacts other than response opportunities as defined above were coded as either teacher-afforded communications (individual feedback regarding seat-work or homework, requests that the child perform procedural or caretaking functions, and disciplinary action or

evaluative comment about the child's behavior) or interactions initiated by the child (calling out answers, showing work to the teacher or asking questions about it, and seeking permission or other procedural contact). Sequential data were also built into the coding of these interactions. In addition to coding the type (academic, procedural, or disciplinary) and initiator (teacher or child) of the interaction, coders also kept track of the evaluative nature of the teacher's feedback (praise, criticism, or impersonal feedback). The terms "praise" and "criticism" referred to teacher reactions which went beyond the level of simple affirmation or negation or corrective feedback by complimenting or criticizing the child personally. Simple affirmation ("yes" "o.k.," "that's right") was not considered "praise" unless accompanied by obvious expression or gesture connoting excitement or warmth. The latter reactions were considered "praise," as were the words "good" and "fine," as well as other, more obvious forms of verbal praise. Similarly, simple negation ("no," "that's not it") was not considered "criticism" unless accompanied by expressions or gestures communicating anger or disgust. In addition to the latter responses, verbal statements such as "that's a stupid answer," or "what's the matter with you?" were coded as "criticism." Most teacher feedback involved simple affirmation or negation and/or communication of information and was coded as "impersonal feedback" to distinguish it from praise and criticism. The fourth category, "no feedback," was coded if the teacher did not react in any way to the child's response and simply moved on to something else.

In addition to the coding of dyadic interactions as described above, the hand-raising behavior of the children was tallied as a measure of their tendency to seek response opportunities. This was coded after open questions, when the children raised their hands seeking to be called on to answer the question, and after some direct questions, when children raised their hands if the child called upon to answer the question gave a wrong answer or was unable to respond.

After several pilot applications in which the system was perfected and satisfactory inter-coder reliability was established, observations were made on four separate days in each of the four classes. To equalize the time spent in each classroom and insure that the full range of classroom activities was included, the observation period extended for an entire morning or an entire afternoon (two of each for each class). Data were recorded for all periods of academic activity during the observation period, using one data sheet for the reading group and another for all other situations. No data were recorded when the class was out of the room for recess or washroom breaks. During nonacademic procedural activities (clean-up, getting in line, pledge to the flag, etc.), only disciplinary actions and behavioral evaluations were coded.

Data were recorded by two observers seated at the rear of the classroom. The observers were thus in front of the teacher but behind or to the side of the majority of the children, who were seated at small tables of six or eight. During each observation, one observer coded the interactions involving the six highs and the other coded the six lows. It had originally been intended that assignment of children to observers would be determined by seating location, since coding could be done more conveniently when the target children are seated close together. However, in three of the four classrooms the children were seated in order of achievement level (a fact which is itself a correlate of expectancy effects, as will be pointed out below), so that observations were made on intact high or low groups. Each observer's assignments were balanced between the high and low groups to eliminate the possibility that any obtained differences between expectancy groups could be attributed to observer differences.

Data Analysis

A variety of measures were derived from the raw coding sheets through simple arithmetic procedures, and scores were assigned to each of the 48 individual subjects. Analyses of variance then were performed to assess the effects of teacher expectancy, sex, and classroom

(teacher) and their respective interactions on the obtained scores. Two types of measures were identified. The first, subsuming most of the simple frequency counts, involved group differences which are attributable to objective differences in the groups of children themselves. Consequently, any significant group differences discovered in these variables, while important in themselves, could not be taken as evidence of expectancy effects. The second set of measures, mostly percentage figures in which absolute frequency differences are statistically controlled in order to allow a comparison of relative differences between the groups, are interpreted as measures of expectancy effects. Teacher behavior tapped by these measures is more proactive or teacher initiated -- going beyond simple reaction by the teacher to stimulation by the child. The distinction between these two types of measures is exemplified in the results section below, in which the two types of findings are separately presented.

Results

The results are presented in three tables, each giving mean values for the four classes, two sexes, and two expectancy groups and the p-values for group effects in class by sex by expectancy analyses of variance. Although no predictions were made concerning differences by class, the data are presented to show the degree to which the teachers varied on the measures taken. In addition, any interactions of class variation with expectancy effects would affect the interpretation of the latter, and need to be investigated whenever they occur. Inspection of all three tables reveals that a significant class effect was obtained for the great majority of the variables. The greatest class variation occurs on the simple frequency columns, especially in Table 1, although class effects still usually reach significance even in the ratio measures related to teacher expectations presented in Table 3. Because of this large variation across classes and the frequent significant interaction of class with expectancy, the nature of the interaction was specifically investigated for each variable to determine the consistency of expectancy effects. This information is integrated into the discussion of expectancy effects below.

Tables 1 and 2 contain the data from variables measuring objective differences among the children or aspects of teacher-child interaction which cannot be unambiguously interpreted as due either to teacher expectation effects or to objective differences amont the children. Data from variables which do appear to be independent of differences among the children and therefore interpretable as indices of expectation effects are presented in Table 3.

Measures of the quantity and type of teacher-child contacts are shown in Table 1. Other than the large class differences, the data are most notable for the consistency of expectancy group differences on variables measuring the tendency to seek out the teacher and initiate contact with her. Children for whom the teacher held high expectations (highs) raised their hands more frequently and initiated more procedural and especially more work-related interactions than did children for whom the teachers held low expectations (lows). The class x expectancy group interactions with regard to child-initiated contacts reflect degree rather than direction of effect. The highs exceeded the lows in each class for hand raising, initiating work-related interactions, and total child-initiated response opportunities (the hand-raising effect excludes Class 1, where it could not be assessed because the teacher never asked open questions while her class was being observed). The highs also exceeded the lows in three of the four classes in initiating procedural interactions. There was a negligible reversal in Class 2, where this type of interaction was very infrequent (highs averaged 1.50, lows averaged 1.67). The only exception to the pattern of significant differences between highs and lows in child-initiated interactions occurred in the measure of calling out answers in the reading groups. The mean difference is in favor of the highs, but it is not a significant difference and the effect occurred in only one of the four classes. The data for child-initiated contacts may be summarized, then, in the statement that, outside the reading group at least, the highs seek out the teacher and initiate interactions with her more frequently than the lows. The difference is especially notable in

work-related interactions: the highs much more frequently show their work to the teacher or ask her questions about it, and they initiate many more response opportunities.

The data for contacts initiated or controlled by the teacher are less clear than for those initiated by the children. The highs were called on more frequently to answer open questions, but the teacher initiated more procedural and work-related interactions with the lows and afforded them slightly more response opportunities. None of these differences reach significance, however. The only significant difference occurred with teacher-afforded behavioral criticisms, which more frequently went to the lows than the highs. This effect showed an important interaction with sex, due to the high frequency of teacher criticisms directed at boys in the low group. Males in the low group averaged 8.25 teacher behavior criticisms, as compared with 2.25 for boys in the high group (the corresponding figures for girls are 1.58 and 1.83). Sex also interacted with expectancy in the measure of hand raising, and again the boys in the low group were notably different from the other three groups. These boys averaged 6.25 on the hand-raising measure as compared to 17.75 for the boys of the high group (corresponding figures for the girls are 11.50 and 15.58).

The data regarding interactions initiated or controlled by the teacher may be summarized as follows: there is a tendency for the teachers to initiate more contacts with the lows than with the highs, but the teachers cannot be said to have been compensating for the superiority of the highs in child-initiated contacts because the trend is not completely consistent and because the only significant differences occur with teacher criticisms rather than with work-related contacts or provision of response opportunities. While the data for child-initiated contacts showed strong expectancy group differences, the measures of teacher-initiated interactions were much more closely related to sex than to expectancy. Boys were higher than girls on all measures of teacher-initiated contacts; significantly so for work-related interactions, behavioral criticisms,

and total teacher-afforded response opportunities. When teacher-child dyadic contacts of all types are totaled, a clear difference favoring boys is evident; there is no difference between expectancy groups. Differences between the highs and the lows are in quality rather than quantity of interaction with the teacher.

Group differences in quality of academic performance and in frequencies of teacher praise and criticism are presented in Table 2. Consistent expectancy group differences appear for all the variables in this table. The highs produced more correct answers and fewer incorrect answers than the lows, had fewer problems in the reading groups, and achieved higher average scores on the Stanford Achievement Test given at the end of the year. They also were given more praise and less criticism than the lows by the teachers. The direction of difference follows this pattern in all four classes for every variable in Table 2 except for the total correct answers, where the group means were equal in one class. Thus the class by expectancy interactions affected the degree but not the direction of expectation effects.

Sex effects also appeared, with boys producing more correct answers and receiving more criticism than girls. The other, non-significant, differences in favor of boys are consistent with the finding noted above that boys tend to have more interactions with the teacher than girls. A sex by expectancy group interaction occurs for the measure of total criticism which is similar and related to the one reported for behavioral criticism in Table 1. For the boys in the low group, teacher criticism was present in 32.50 per cent of their dyadic contacts with the teacher. The corresponding figure for the high boys is 13.25 per cent, for the low girls 16.17 per cent and for the high girls 8.25 per cent.

In summary, the data of Table 2 show that teacher expectancy consistently predicts objective measures of classroom performance, objective achievement test scores, and rates of teacher praise and criticism. Hypotheses about the role of expectation effects in producing these relationships cannot be evaluated from the data in

Table 2, however, since the type and direction of causal mechanisms at work remain unknown.

Group differences on variables interpretable as indices of teacher expectation effects are presented in Table 3. Significant group differences on these measures suggest that the teachers were systematically, although not necessarily deliberately or consciously, treating one group more favorably than the other. The first two measures concern provision of response opportunities to the children, and may be considered in combination with the data previously discussed in Table 1. Since the highs create more response opportunities for themselves than the lows, do the teachers compensate for this by calling on the lows more frequently? The data suggest only a slight tendency in this direction at best. The teachers definitely do not compensate by asking the lows more direct questions, since the mean on this variable for the lows is less than that for the highs, although not significantly. The mean for direct questions in the low group would have been increased if "discipline" questions had been included in their figures. These were very special questions which appeared only in the low group, but not with sufficient frequency to be analyzed as a separate variable. "Discipline" questions were direct questions which ostensibly asked for academic content ("what's the next word, John?"), but which were directed at children not paying attention. In these instances the teacher's questions appeared to function as control techniques rather than as response opportunities, and so they were not included in the totals for the direct questions. If they had been included the results would have been an increase in the mean for direct questions in the low group, but this mean value would still be below that for the highs.

The one teacher measure which does suggest some compensation concerns the teacher's behavior in calling on children to answer open questions. When the number of times the child is called on is weighted by the number of times he raised his hand to seek a response opportunity, the resulting recognition rates showed a significant difference in favor of the lows. However, this difference seemed

more due to the large difference in hand raising rate between the two groups of children rather than to any systematic compensation efforts by the teachers. The recognition rates in Table 3 are not adjusted for the fact that more highs than lows were likely to be raising their hands seeking an opportunity to answer a given question, so that a single response opportunity had less effect on the recognition rates of the highs than on those of the lows. The rates may be adjusted by treating the highs and the lows as groups and discounting hand raising by other members of the group when one member of the group is called on. When the hand raising totals are reduced in this manner, the resultant recognition rates still favor the lows, although the difference no longer approaches statistical significance.

In summary, the data on quantity of contacts in Table 1 and Table 3 are neutral with regard to expectation effects. The highs initiate more work-related contacts and create more response opportunities for themselves than do the lows, but there is no unequivocal evidence to suggest that the teachers are systematically either exaggerating or compensating for these differences among the children.

The data for the last five variables in Table 3 comprise the major findings of the study, since they provide direct evidence that the teachers' differential expectations for performance were being communicated in their classroom behavior. The measures involved are all concerned with the teachers' reactions to the children's attempts to answer questions and read in the reading group. All are percentage or ratio measures which take into account absolute differences in the frequencies of the various behaviors involved so as to enable a direct comparison to be made between the teachers' behavior toward the two groups when faced with equivalent situations. The data show that the teachers consistently favored the highs over the lows in demanding and reinforcing quality performance. Despite the fact that the highs gave more correct answers and fewer incorrect answers than did the lows, they were more frequently praised when correct and less frequently criticized when incorrect or unable to respond. Furthermore, the teachers were more persistent in

eliciting responses from the highs than they were with the lows. When the highs responded incorrectly or were unable to respond, the teachers were more likely to provide a second response opportunity by repeating or rephrasing the question or giving a clue than they were in similar situations with the lows. Conversely, they were more likely to supply the answer or call on another child when reacting to the lows than the highs. This group difference was observed both for difficulties in answering questions and for problems in reading during reading group. Finally, the teachers failed to give any feedback whatever only 3.33 per cent of the time when reacting to highs, while the corresponding figure for lows is 14.75 per cent, a highly significant difference.

Group differences in the direction of expectancy effects occur for all four classes on three variables; small reversals occur in the measure of criticism following wrong responses in one class and in the measure regarding teachers' reactions to reading problems in another class. These are the only measures for which the class by expectancy interaction is significant.

Significant sex effects also appear in Table 3, as they have previously. These show that boys receive more direct questions from the teacher than girls and that they are praised more frequently when giving correct answers. The difference on direct questions fits in with the general finding that boys tend to have more interactions of all kinds with the teachers than girls. The data concerning praise are more surprising, in view of the preponderance of criticism toward boys noted earlier. Taken together, the data on teacher praise and criticism in Tables 1, 2, and 3 suggest that the teachers are generally more evaluative in responding to boys and more objective in responding to girls. Boys are praised more often after correct responses and criticized more often after incorrect responses or failures to respond, although the latter difference is not statistically significant. The general preponderance of critical comments toward boys noted earlier is apparently due to behavioral criticisms rather than to critical comments made during work-related interactions.

Discussion

The data of Tables 1 and 2, which show objective differences among the children related to their sex and achievement levels, are quite consistent with previous findings. The finding that high-achieving students receive more teacher praise and support (Hoehn, 1954; de Groat and Thompson, 1949; Good, 1969) was confirmed in the present study. Hoehn's suggestion that the differences between high and low achieving students in the interaction with their teachers were in quality rather than quantity of interaction is also compatible with present findings. The finding that teachers have more disapproval contacts with boys than girls has also been frequently reported (Meyer and Thompson, 1956; Lippitt and Gold, 1959; Jackson and Lahaderne, 1967). Meyer and Thompson, (1956) also reported greater praise toward boys, as was found in the present study in work-related interactions. Taken together, the findings on sex differences in the present study may be summarized as follows: boys have more interactions with the teacher than girls and appear to be generally more salient in the teacher's perceptual field. Teachers direct more evaluative comments toward boys, both absolutely and relatively. The largest and most obvious absolute difference in evaluative comments occur with teacher criticism and disapproval, which are directed far more frequently at boys. However, much of this difference appears to come in the form of behavioral criticisms and disciplinary contacts rather than criticisms of academic performance in work-related contacts. The difference appears attributable to more frequent disruptive behavior among boys which brings criticism upon themselves rather than to a consistent teacher set or bias toward being more critical toward boys than girls in equivalent situations. The latter statement agrees closely with the conclusion of Davis and Slobodian (1967), who studied teacher provision of response opportunities and evaluation of children's performance in reading groups.

While sex differences are attributable to objective differences in the classroom behavior of the children, the data in Table 3 show that differences related to teacher expectancy are only partly

attributable to the children themselves. When the latter differences are statistically controlled through the use of percentage measures, it is seen that the teachers systematically discriminate in favor of the highs over the lows in demanding and reinforcing quality performance. Teachers do, in fact, communicate differential performance expectations to different children through their classroom behavior, and the nature of this differential treatment is such as to encourage the children to begin to respond in ways which would confirm teacher expectancies. In short, the data confirm the hypothesis that teachers' expectations function as self-fulfilling prophecies, and they indicate some of the intervening behavioral mechanisms involved in the process. Despite large differences in the frequencies of the various behaviors observed in the four classrooms, expectancy effects were consistent across the four teachers (two of the teachers favored the highs on four of the last five measures in Table 3, while the other two favored the highs on all five measures).

Although the direction of difference in treatment of highs and lows was constant across teachers, there were observable differences in degree. In particular, one teacher stood out as extreme in this regard, while another showed relatively small differences, even though the direction of difference was constant. It is of interest that the latter teacher, who showed the least discrimination between highs and lows, was the teacher who did not group the children by achievement in her classroom seating pattern. It is also worthy of note that although the teachers' expectations were highly related to the children's achievement test scores within classes, the achievement scores are not so closely related to the previous readiness and achievement data which were used as the basis of tracking into classrooms. That is, the class achievement of some classes was higher than expected, while that of others was lower. While not enough classes were included to allow a statistical test, the data suggest that the achievement levels of the classes were related to the teachers' performance demands and expectations.

While this research has demonstrated the applicability of classroom interaction analysis methods to the study of the communication of teacher expectations and has yielded data which are consistent and interpretable as far as they go, it has dealt with only a few of the events intervening between the formation of teacher expectations and the initiation of reciprocal behavior by the children. Several related studies are needed to complete the picture. For instance, if differential teacher treatment leads to differential reciprocal behavior by the children, the classroom behavior of highs and lows should become progressively more differentiated as the school year progresses. Hand raising, child initiation of work-related interactions, and other indices of attempts by the child to seek response opportunities or academic interactions should show this kind of progressive differentiation between groups. Another set of questions has to do with intervention attempts. Can teachers be made aware of their discriminatory classroom behavior? Can they learn to compensate, not only for their own differential expectations but also for objective differences in the classroom behavior of the children? Will experimentally induced expectations produce the same differences in classroom behavior as expectations formed "naturally" by the teachers themselves? These and related questions will be taken up in future research.

Additional indices of the ways in which teachers discriminate in their classroom behavior are also needed to add to our understanding of the processes involved and to increase the effectiveness of teacher education and classroom intervention in preventing or reducing the problem. Anecdotal observations taken during the present research suggest that other useful indices of teacher communication of differential performance expectations may be possible. Possibilities being presently explored include differences in the type of feedback given to the children (inquiry into the processes underlying the response product rather than simple negation or provision of the right answer) and differential enforcement of teacher expectations

(discouraging initiative in some children by doing things for them while requiring other children to do the same things themselves). Teachers are frequently unaware of the subtle differences in their behavior in such situations, yet it is in such situations that teachers systematically communicate differential expectations to different students. Although subtle, such teacher behavior is observable and measurable, and therefore at least potentially subject to modification and control.

TABLE 1. Group differences in quantity and type of contacts with teachers

Variable	Group Means							
	Class				Sex		Expectancy	
	1	2	3	4	Boys	Girls	Lows	Highs
Number of times child raises hand	0.00*	4.00	25.75	21.33	12.00	13.54	8.88	16.67
Number of times child is called on to answer a question	0.00*	0.67	4.08	2.58	2.13	1.54	1.71	1.96
Procedural interaction initiated by child	5.00	1.58	7.08	2.92	4.92	3.38	3.17	5.13
Work-related interactions initiated by child	4.17	1.67	9.58	2.92	5.29	3.88	1.79	7.38
Teacher-initiated procedural interactions	4.58	2.75	1.25	0.67	2.50	2.13	2.58	2.04
Teacher-initiated work-related interactions	9.83	4.50	4.58	0.67	6.42	3.38	6.00	3.79
Teacher-afforded behavioral criticisms	3.25	1.58	5.92	3.17	5.25	1.71	4.92	2.04
Teacher-afforded questions during reading groups	4.50	2.58	3.75	5.33	4.63	3.46	4.79	3.29
Calling out answers during reading groups	8.08	1.58	2.83	0.50	3.58	2.92	2.96	3.54
Total teacher-afforded response opportunities	10.33	6.00	12.17	14.00	11.75	9.50	10.96	10.29
Total child-initiated response opportunities	17.25	4.83	19.50	6.33	13.79	10.17	7.92	16.04
Total dyadic contacts	46.17	20.08	45.75	25.67	41.33	27.50	33.67	35.17

*There were no open questions in class 1.

TABLE 1. Group difference in quantity and type of contacts with teachers

Variable	p-values for group effects						
	Class	Sex	Expectancy	Class x Sex	Class x Expectancy	Sex x Expectancy	Class x Sex x Expectancy
Number of times child raises hand	.001	ns	.01	ns	.01	.05	.10
Number of times child is called on to answer a question	.001	ns	ns	ns	ns	.05	ns
Procedural interaction initiated by child	.001	.05	.05	.05	ns	ns	.01
Work-related interactions initiated by child	.05	ns	.01	ns	.05	ns	ns
Teacher-initiated procedural interactions	.001	ns	ns	ns	.05	ns	ns
Teacher-initiated work-related interactions	.001	.05	ns	.05	.05	ns	ns
Teacher-afforded behavioral criticisms	.05	.01	.01	ns	ns	.01	ns
Teacher-afforded questions during reading groups	ns	ns	.10	ns	.01	ns	ns
Calling out answers during reading groups	.001	ns	ns	ns	ns	ns	ns
Total teacher-afforded response opportunities	.001	.05	ns	ns	ns	ns	ns
Total child-initiated response opportunities	.001	ns	.01	ns	.05	ns	ns
Total dyadic contacts	.001	.01	ns	ns	ns	ns	ns

TABLE 2. Group differences in academic performance and teacher evaluations

Variable	Group Means							
	Class				Sex		Expectancy	
	1	2	3	4	Boys	Girls	Lows	Highs
Total correct answers	8.67	4.75	9.33	8.42	8.13	6.46	6.67	8.92
Total part-correct, incorrect, or "don't know" responses	4.33	2.08	3.58	4.00	3.88	3.13	4.63	2.38
Total problems in reading during reading group	16.75	1.46	11.75	6.83	9.38	9.02	13.04	5.35
Average number of reading problems per turn during reading group	3.00	1.38	6.03	3.39	3.83	3.06	4.67	2.23
Total number of times praised by teacher/total dyadic contacts	9.17	7.33	0.00	3.25	7.71	7.17	3.88	11.00
Total number of times criticized by teacher/total dyadic contacts	16.58	13.42	23.75	16.42	22.88	12.21	24.33	10.75
Criticism/Praise + Criticism	61.92	68.83	63.33	82.38	73.00	65.23	85.04	53.19
Average SAT score (grade level equivalent)	1.79	1.57	1.39	1.73	1.58	1.66	1.42	1.82

TABLE 2. Group differences in academic performance and teacher evaluation

Variable	p-values for group effects						
	Class	Sex	Expectancy	Class x Sex	Class x Expectancy	Sex x Expectancy	Class x Sex x Expectancy
Total correct answers	.05	.05	.10	ns	ns	ns	ns
Total part-correct, incorrect, or "don't know" responses	ns	ns	.01	ns	ns	ns	ns
Total problems in reading during reading group	.001	ns	.001	ns	.05	ns	ns
Average number of reading problems per turn during reading group	.01	ns	.01	ns	ns	ns	ns
Total number of times praised by teacher/total dyadic contacts	.05	ns	.001	ns	.10	ns	ns
Total number of times criticized by teacher/total dyadic contacts	.10	.001	.001	ns	.05	.05	ns
Criticism/praise + criticism	ns	ns	.001	ns	ns	ns	ns
Average SAT score (grade level equivalent)	.001	ns	.001	ns	ns	ns	ns

TABLE 3. Group differences on variables related to the communication of teacher expectations

Variable	Group Means							
	Class				Sex		Expectancy	
	1	2	3	4	Boys	Girls	Lows	Highs
Number of direct questions from teacher	0.42	2.00	2.25	4.00	2.67	1.67	1.83	2.50
Number of times called on to answer open questions/number of times child raises hand	*	0.17	0.16	0.12	0.18	0.14	0.20	0.12
Percent of correct answers followed by teacher praise	6.25	7.17	19.25	3.25	12.83	5.13	5.88	12.08
Percent of wrong answers followed by teacher criticism	34.08	12.46	2.08	1.83	15.50	9.73	18.77	6.46
Percent of wrong answers followed by repetition or rephrasing of the question	9.75	18.71	14.79	33.88	23.88	14.69	11.52	27.04
Percent of reading problems followed by repetition or rephrasing of the question or by giving a clue	75.08	45.75	38.91	44.64	52.10	53.39	38.37	67.05
Percent of answers (correct or incorrect) not followed by any feedback from the teacher	22.50	8.92	10.58	14.17	8.00	10.08	14.75	3.33

*There were no open questions in class 1.

TABLE 3. Group differences on variables related to the communication of teacher expectations

	p-values for group effects						
	Class	Sex	Expectancy	Class x Sex	Class x Expectancy	Sex x Expectancy	Class x Sex x Expectancy
Number of direct questions from teacher	.01	.10	ns	ns	ns	ns	ns
Number of times called on to answer open questions/number of times child raises hand	ns	ns	.05	ns	ns	ns	ns
Percent of correct answers followed by teacher praise	.01	.01	.05	ns	ns	ns	ns
Percent of wrong answers followed by teacher criticism	.001	ns	.01	.001	.05	ns	ns
Percent of wrong answers followed by repetition of rephrasing of the question	ns	ns	.10	ns	ns	ns	ns
Percent of reading problems followed by repetition or rephrasing of the question or by giving a clue	.05	ns	.01	ns	.01	ns	ns
Percent of answers (correct or incorrect) not followed by any feedback from the teacher	.10	ns	.001	ns	.05	ns	ns

*There were no open questions in class 1.

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